

FRAGMENTED INFRINGEMENT OF COMPUTER PROGRAM PATENTS IN THE GLOBAL ECONOMY

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ABSTRACT

As validly granted computer program and Internet-related patents are used and enforced, complex questions accompany them. Enforcement of computer program and Internet patents raise several interesting points that shed light

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on how the doctrines surrounding patent infringement are structured. Since computer programs are highly accumulative and incremental, patents on them increase the possibility of partial or incomplete infringement. In today's global economy, modular production of computer program products often involves cross-border production and distribution, using various production factors. In contrast, patent rights are based on the concept that those rights are territorial. In this regard, infringement is often accomplished by a singular and complete action taking place in one territory. This paper discusses how computer program patents challenges this model of a single infringer within one territory performing one complete action. In the context of a global economy, this paper comparatively reviews some of the theories of infringement in the patent laws of Japan, the United States and Europe that aim to bridge the patchwork of patent infringement doctrines to regulate these fragmented activities.

I. INTRODUCTION

Computer programs and computerized business methods that concern Internet-based activities are more and more likely to be eligible for patent protection under the current state of law in major patenting nations.¹ The eligibility of computer programs for patenting has been a subject of controversy.² While some have embraced eligibility for computer programs and business methods, others have argued that this exemplifies a significant change in the patent system.³ These debates have focused on problems and complexities surrounding patent grants. Particularly, commentators argue that, due to the lack of a prior art and qualified examiners in this field, invalid patents are likely to be issued.⁴ As validly granted computer program and Internet-related patents are used and

¹ Nari Lee, *Patent Eligible Subject Matter Reconfiguration and The Emergence of Proprietary Norms—The Patent Eligibility of Business Methods*, 45 IDEA 321, 329–31 (2005).

² Many of these applications may fail to meet the substantive standard of patentability, and in most jurisdictions patents may not grant. However, even the validly issued patents may be problematic, especially in terms of competition. More serious complexity of this subject matter expansion comes at the post-grant, enforcement level. As patents exclude all other players in a field, they create incentives for firms to file for patents to defend themselves. Failure to file for a patent may lead to costly infringement litigation, therefore creating incentives for firms to build patent portfolios to defend themselves against claims of infringements in the future. It is in this defensive context that patents may create concerns in competition.

³ See, e.g., Vincent Chiappetta, *Defining the Proper Scope of Internet Patents: If We Don't Know Where We Want to Go, We're Unlikely to Get There*, 7 MICH. TELECOMM. & TECH. L. REV. 289, 298 (2001); John R. Thomas, *The Patenting Of The Liberal Professions*, 40 B.C. L. REV. 1139, 1139–40 (1999).

⁴ See Chiappetta, *supra* note 3, at 333.

enforced, more complex questions arise.⁵ Since computer programs are highly accumulative and incremental, even when used in a non-Internet context, computer program patents have an increased likelihood of partial or incomplete infringement.⁶ In today's global economy, modular production of computer program products often involves cross-border production, which can lower production costs.

When used in the context of the Internet, cross-border production becomes more problematic, since it presupposes transnational access as well as transnational effects. In contrast, patent rights are territorial because they are based on national patent law.⁷ Thus, infringement only occurs by a singular and complete action in one territory.⁸ This paper discusses how, as uses of computer programs and system products become more fragmented, computer program patents challenge the model of a single infringer within one territory performing one complete act of infringement. In the context of a global economy, this paper comparatively reviews some of the theories of infringement that aim to bridge the patchwork of patent infringement doctrines in order to regulate these fragmented activities, in the patent laws of Japan, the United States and Europe.

II. COMPUTER PROGRAM PATENT INFRINGEMENT IN A GLOBAL ECONOMY

Infringement of a right of any kind presupposes the valid existence of that right and a legally defined act of infringement within the scope of the right.

⁵ See, e.g., *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 393–94 (2006) (holding that courts should strictly apply the traditional four equity factors used to determine injunctions in patent cases). In the United States, where this change was deemed more evident, a question of threat to enforce by so-called “patent trolls” (i.e., non-practicing patent right holders) has created concerns for competition in general, and has culminated in the recent *eBay* decision. In a unanimous ruling, the United States Supreme Court found that the standard for injunctive relief in patent infringement cases should be as strict as in other cases—four further equity justifications other than the conditions of the Patent Act are required—and vacated the lower court's ruling. The decision was viewed as a means of curtailing patent trolling, as the threat of enforcement does not automatically carry the threat to enjoin the infringer.

⁶ “Partial” in this paper is used broadly to emphasise the incompleteness of the infringing actions in terms of patent claims. This includes any non-identical and non-literal infringement of the patented claims.

⁷ Hanns Ullrich, *Technology Protection According to TRIPS: Principles and Problems, in FROM GATT TO TRIPS* 357, 363 (1996).

⁸ *Id.*

Additionally, most patent laws provide that certain proscribed acts within the scope, life and territory of the patent constitute infringement.⁹

In the case of computer programs, especially those used in the context of the Internet, three aspects—INFRINGEMENT acts, scope of claims, and territories of use—could be distributed or divided.¹⁰ This is partly because today’s modular and complex business environment enables the use of an invention by multiple actors who may be located in different territories. Firms use different production factors in the global economy to maximize their competitive advantage. If market share is lost to competitors due to their use of cheaper imported spare parts and modules, firms may relocate and manufacture the parts abroad to remain in the market. In this context, use of an invention related to a modular product may well also be modular. If patent claims are written in a modular manner (i.e., combination claims with sub-combinations), modular use may implicate only “partial” infringement. To further complicate matters, patents for these inventions may be directed toward a systems product, where one right covers only part of a product. One patented invention may be only a minor part of a complex systems product, and sometimes the product may not even use the entirety of the claimed invention. It is likely that multiple patents cover one computer program, and fragments of multiple patents may cover the use of one function of a commercially available program.

Further, claims to Internet-related patents may employ distributed perspectives by design or by necessity. Computer networking via the Internet may require that some of the steps of a method occur at a server location and other steps occur at a user location. Thus, some elements of the claims of Internet patents may be performed by distinct and distributed actors, with the ultimate effect of the invention realized by yet another actor, all while leaving only traces of the steps performed in the process. Unlike copyrighted computer code, finding infringement of claims in these multiple actions by multiple actors is a complex task, since the patent deals with the inventive ideas behind the coded expression. Although patents may be granted on a computer program that is tied to a device or a machine, an element of the invention might still be highly abstract if divided into parts.

Generally, two types of claims are feasible in software patents: claims covering a pure computer program for use in connection with a network or the Internet (known as an article of manufacture in the United States, a computer

⁹ *Id.*

¹⁰ Mark Lemley et al., *Divided Infringement Claims*, 33 AIPLA Q.J. 255, 256 (2005). The authors highlight two different types of patent claims called “multi-user” and “multi-jurisdiction” claims as examples of divided or distributed claims.

program product claim in the European Patent Convention, and a “mono” claim in Japan), and claims covering a product/machine or process connected to a network using the computer program (i.e., a machine, device apparatus claim, or process claim). Because most Internet activities involve connecting a computer to the Internet, it is likely that the inventiveness of Internet-related patents lies in the combinations of steps and elements, and not in an individual step or element that is obvious or known.¹¹ An invention may lie with a computer program solution, but the claims may be structured in such a way that the computer program may be only a component of the invention. Other parts of the claims may relate to the building blocks of the network, either to describe or distinguish the invention from the prior art. In this respect, extending patent protection to the sub-combination or modules is an over-reaching expansion of the scope of patent claims.

Patent laws address partial infringement, or fragmented use. For example, patent laws in various countries recognize liability for those who are not directly using the patent by practicing the entirety of the claims.¹² In some cases, this is considered direct liability by the doctrine of equivalents for those who are using parts of the claims but substituting equivalents for other parts. Although disagreement still persists on the range of equivalents and the limitations, variants of the doctrine that expand the scope of protection beyond the literal texts of the claims (non-literal infringement or infringement by non-identical use) is found in many countries’ case law, and sometimes even in statute.¹³ Furthermore, when substitutions are not found in patent law, many coun-

¹¹ See GREGORY A. STOBBS SOFTWARE PATENTS 637–45 (2000); see also Julie E. Cohen and Mark A. Lemley (2001) *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 26 (2001) (arguing that most inventions are likely to be at parts of a computer program).

¹² See *infra* note 14 and accompanying text.

¹³ See *Tsubakimoto Seiko v. THK K.K. (Ball Spline Case)*, 1630 HANREI JIHŌ 32 (Sup. Ct. 1998). For English commentary of the case, see Toshiko Takenaka, *The Doctrine of Equivalents in Japan*, 6 CASRIP PUBLICATION SERIES: RETHINKING INT’L INTELL. PROP. 125, 125–26 (2000), available at <http://www.law.washington.edu/Casrip/Symposium/Number6/Takenaka.pdf>. In the United States, the doctrine, originating from *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607–08 (1950), is still alive despite the limitation based on *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 741 (2002). In Europe, the doctrine of equivalents is part of the European Patent Convention (EPC) article 69. Any element which is equivalent to an element specified in the claims are called to be considered in the interpretation of the claims, in the Protocol to Amend the Convention of the Grant of European Patents, Oct. 7, 1977, article 2 (as revised Nov. 29, 2000) [hereinafter *EPC Protocol*]. For the detailed practices of European claim interpretation, see generally INTERPRETATION OF PATENTS IN EUROPE – APPLICATION OF ARTICLE, 69 EPC 251–84 (2006).

tries include secondary liability for those who are not directly involved in infringing conduct, but induce or contribute to directly infringing uses.¹⁴

In this context, enforcement of computer program patents in the international setting must address two fundamental aspects of patent law: 1) liability for fragmented use; and 2) how to reconcile the geographical location of the infringement and the principle of territoriality. In essence, this is a question of how to consolidate the incomplete actions (including extra-territorial actions) of multiple parties.

III. INFRINGING CONDUCT AND CLAIMS OF COMPUTER PROGRAM PATENTS

In many countries, patent laws regulate the types of actions considered infringing actions. All actions that are not prohibited by law are considered legitimate. For example, the act of an Internet shopper who buys a book using Amazon.com's patented one-click method may not be viewed as infringing conduct in most countries; neither is the act of a patient's "use" of a patented drug by consumption of the medicine. Not all uses are infringing uses. This is often explained by policy considerations of patent law—that the inhibiting aspect of a patent right is limited to those actions that are related to uses by potential competitors in the market.¹⁵ Thus, while society benefits from disclosure of the invention, patent holders may recoup the cost of the invention by authorizing use of those patent rights in return for valuable consideration.

In this regard, finding liability for patent infringement starts from interpreting the types of prohibited conduct in law based on the patent's claims as compared with the actual conduct that involves those patent claims.

¹⁴ In Japan, Japanese Patent Law, Act No. 121 of 1959, art.101, *translated at* <http://www.cas.go.jp/jp/seisaku/hourei/data/PA.pdf>. The English translation does not include the 2006 patent law revision by Law Revising Parts of the Design Law and Others, Law No. 55 of 2006 [hereinafter *JP Law Revision 2006*] to articles 2.3 and 101, which is not yet in force. In the United States, see 35 U.S.C. § 271(b), (c), (f), (g) (2006). In Europe, see Agreement Relating to Community Patents, Article 26, Dec. 15, 1989, 89/695/EEC [hereinafter, Community Patent Convention]. The Convention is not in force, as only seven out of twelve signatory states ratified it. Those countries that have ratified this convention have in their domestic patent law articles to the similar to Article 26.

¹⁵ See, e.g., Maureen A. O'Rourke, *Toward a Doctrine of Fair Use in Patent Law*, 100 COLUM. L. REV. 1177, 1179 (2000).

A. TRIPs Agreement and Patent Infringement by Export

At a glance, the standard for infringing conduct is relatively harmonized by the World Trade Organization’s (the “WTO”) Agreement on Trade-Related Aspects of Intellectual Property (the “TRIPs agreement”).¹⁶ Although ultimate findings of infringement depend on what national laws prohibit,¹⁷ the minimum standards under Article 28 of the TRIPs Agreement harmonize what types of acts will be regulated as infringement in WTO member states.¹⁸ These actions include unauthorized manufacturing, use, sale, offer for sale, and importation of the product, and, in the case of a process patent and the act of using the process of using, offering for sale, selling, or importing for these purposes the product obtained directly by that process.¹⁹ Consequently most WTO member states implemented these actions into their own patent legislation.²⁰

The list of infringing actions includes acts such as “offer[ing] to sell” and “import[ing]” that are seemingly less direct than the actual making or using of the invention.²¹ It may seem that the text of Article 28 regulates indirect aspects of infringement. Although Article 28.2 regulates using products that are directly obtained by a process within the scope of prohibited activities, it leaves room to argue that TRIPs implies that a non-literal use of an invention is regulated as a directly infringing activity.²² This may also apply in a case where the product itself is not patented.²³

¹⁶ Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 28, Apr. 15, 1994, 33 I.L.M. 81 (1994) [hereinafter TRIPs Agreement].

¹⁷ The TRIPs Agreement is not considered a self-executing treaty in most of the countries party to it, including Japan, the United States and in the many European Union countries. A recent decision of the European Court of Justice reaffirms this view that there is no direct effect of the TRIPs Article 33, which is relatively clearly termed. *See* Case C-431/05, *Merck Genéricos-Produtos Farmacêuticos, Lda v. Merck & Co.*, 2007 E.C.R. I-0000.

¹⁸ TRIPs Agreement, *supra* note 16.

¹⁹ *Id.* art. 28.1.

²⁰ Japanese Patent Law, *supra* note 14, art. 2(3)(i) (using the phrase “offer for assignment,” which means the transfer of title in the legal sense, thus something close to a sale); 35 U.S.C. § 271(c) (2006) (using the phrase “offer to sell”); U.K. Patent Act § 60(1) (1977), available at <http://www.ipo.gov.uk/patentsact1977.pdf> (using the phrase “offers to dispose”); Community Patent Convention, *supra* note 14, Article 25(a) (using the phrases “offering” and “putting on the market” as direct use of the invention).

²¹ 35 U.S.C. § 271(c).

²² *See* UNCTAD-ICTSD, RESOURCE BOOK ON TRIPS AND DEVELOPMENT: AN AUTHORITATIVE AND PRACTICAL GUIDE TO THE TRIPS AGREEMENT 414–15, 420–22 (2005) [hereinafter RESOURCE BOOK].

²³ *Id.* at 420–22.

The term “offer to sell” is generally understood as being directed toward preliminary activities relating to a sale.²⁴ Exactly when preliminary activities become the subject of direct infringement leaves room for interpretation. For example, the text of the TRIPs Agreement does not make clear whether such an offer must result in an ultimate sale or assignment in order for infringement to occur. Is an offer sufficient, or must it be met with acceptance leading to a sale? More importantly, an offer for sale may include an offer for international sale (exporting), and it is not clear whether this “offer for sale” means that exporting needs to be regulated as this direct infringing conduct. The text of Article 28 itself does not distinguish direct infringement from indirect or non-literal infringement.²⁵ It simply provides that members should regulate certain economic activities as infringement.²⁶ In comparison, other legislative examples such as the Community Patent Convention distinguish direct use from indirect use and distinguish “offer” from “supplying or offer to supply.”²⁷

The list under Article 28 may seem exhaustive, in the sense that each act must be prohibited as a minimum requirement. This means other actions may be viewed as non-infringing conduct. However, since Article 28 only establishes a minimum requirement, national laws may prohibit conduct that goes beyond the scope of prohibitions required by the TRIPs agreement. For example, one significant distinction not accounted for in Article 28 is infringing acts concerning components of patented products, such as assembling or repairing those components. Repair and modification often touches upon the boundary of making. It is logical to think that if these acts amount to reproduction of the patented products that the acts may be viewed as direct “making” and may thus be prohibited under Article 28.²⁸ On the other hand, if assembly only amounts

²⁴ 35 U.S.C. § 271(c).

²⁵ TRIPs Agreement, *supra* note 16, art. 28.1; *see also* RESOURCE BOOK, *supra* note 22, at 420.

²⁶ TRIPs Agreement, *supra* note 16.

²⁷ *Compare* Community Patent Convention, *supra* note 14 art. 25, with *id.* art. 26.

²⁸ TRIPs Agreement, *supra* note 11, art. 28.1; *see also* RESOURCE BOOK, *supra* note 22, at 419. Typically this distinction touches upon the doctrine of exhaustion. For the status of national law in the United States, see Mark R. Patterson, *Contractual Expansion of the Scope of Patent Infringement Through Field-of-Use Licensing* 49 WM. & MARY L. REV. 157, 193–200 (2007). In the United States, this was the issue of debate in the recent *Quanta Computer Inc. v. LG Electronics Inc.*, 128 S. Ct. 28 (2007) (mem.) (argued Jan. 16, 2008), litigation. For a commentary on the case, see Mark R. Patterson, *Reestablishing the Doctrine of Patent Exhaustion*, 2007 PATENTLY-O PATENT L.J. 38 (2007), available at <http://www.patentlyo.com/lawjournal/quanta.patterson.pdf>. Similarly, the doctrine of exhaustion surrounding making and repair has been discussed in the Canon ink cartridge case in Japan. *Canon Inc. v. Recycle Assist Co., Ltd.*, 2005 (Ne) 10021, (IP High Court, Jan. 31, 2006), translated at http://www.ip.courts.go.jp/eng/documents/pdf/g_panel/

to repair the act may not amount to “making.” In this sense, national laws may differ with respect to which conduct involves the direct act of “making,” under Article 28.

Furthermore, there are still debates as to whether there is a requirement to provide computer programs with patent protection under the obligation of Article 27 of the TRIPs agreement. Thus, conduct such as copying, uploading, reproducing, and making computer programs available for access have not been considered in the context of prohibited conduct under Article 28.²⁹ In these instances, an interpretation as to what would actually constitute “making” or “offering” must be determined.

In principle, as member states may choose the manner in which they implement TRIPs obligations, the means of regulating infringement standards is left with those states.³⁰ Thus, as long as acts are prohibited as infringing conduct a member state that regulates an “offer for sale” as an indirect infringement and requires further evidence to prove direct infringement may not be in violation of its TRIPs obligations. Combined with Article 1.1, which allows members to freely determine their means of implementation, the effect of Article 28 may be that certain conduct need not trigger direct infringement liability. Similarly, it is prudent to understand that various modes of non-literal patent infringement are not covered by the text of TRIPs, whether based on the doctrine of equivalents, or by indirect liability based on contributory or induced infringement.³¹

B. Infringing Conduct and Computer Program Patents in National Laws

Two types of direct conduct may need to be distinguished by actors: the act of making or using a patented product, which relates to the person who either manufactures that product or uses a process related to the patented invention, and the act of selling, which relates to those who trade the protected invention and the products implementing the invention.

decision_summary.pdf. For English commentary, see Toshiko Takenaka, *Japan’s IP High Court Finds Infringement For Refilling of Ink in Recycled Ink Cartridges* Canon K.K. v. Recycle Assist K.K., 13 CASRIP NEWSL. 1, (2006), available at <http://www.law.washington.edu/Casrip/Newsletter/Vol13/news13i1Jp1.html>. For Japanese commentary for this case, see Tamura Yoshiyuki, *Recycled Ink Cartridge Products and Patent Infringement - Canon Ink Cartridge Recycling Case*, 330 HÖGAKU KYÖSHITSU 23–27 (2008) (on file with author).

²⁹ TRIPs Agreement, *supra* note 16, art. 28.

³⁰ *Id.* art. 1.1.

³¹ *Id.* art. 28.

As seen above, a person directly engaged in the act of making, using or selling a patented invention is liable for patent infringement under patent laws of WTO member states.³² Thus the act of making a product (i.e., a thing) is often distinguished from the act of using a method/process (i.e., an action). This distinction leads to different types of prohibited conduct in a manner similar to that of TRIPs Article 28.1(b).

Some national patent laws reflect this distinction. Japanese patent law distinguishes the act of making and the act of using, depending upon the category of the patent claims—product or process.³³ Similar distinctions can also be seen in the European Patent Convention, Article 25, which lists both the acts of “making” a product and “using” a process as prohibited direct use of the invention. On the other hand, the United States’ definition of infringement under 35 U.S.C. §§ 154(a)(1) and 271(a) does not distinguish the product (article of manufacture, machine or composition of matter) from the process. Infringement is simply defined in terms of different economic acts of making, using, offering for sale and importing.³⁴ While the type of conduct may not differ with respect to different types of claims, claims must meet the threshold of statutory subject matter in order to be patent eligible.

Furthermore, as patent laws generally do not make industry-specific distinctions, infringing conduct is not defined in the specific context of computer programming. However, one notable consideration of computer program patents is evidenced in the new Japanese patent law. The Japanese Patent Law

³² 35 U.S.C. §§ 154(a)(1), 271(a) (2006). This section defines direct infringement simply as the making, using or selling of a patented invention in the United States without authority from the patent owner. *Id.* See also Japanese Patent Law, *supra* note 14, art. 2(3) (definition of working); *JP Law Revision 2006*, *supra* note 14; Community Patent Convention, *supra* note 14, art. 25. For an example of national implementation of article 25, see U.K. Patent Act, *supra* note 20, § 60(1).

³³ Japanese Patent Law, *supra* note 14, art. 2(3). However, a report by the Japanese Industrial Structure Council minimizes the significance of the distinction. See REPORT PRESENTED BY THE INTELLECTUAL PROPERTY COMMITTEE OF THE INDUSTRIAL STRUCTURE COUNCIL (Dec. 2001) [hereinafter IPC REPORT], available at http://www.jpo.go.jp/shiryou_e/toushin_e/shingikai_e/pdf/bukai_report_e.pdf. More significantly, the law’s 2002 revision allows computerized processes such as a program, to be claimed as a “thing” (product). The distinction has become quite meaningless in the context of computer program patents that were filed after the law’s revision. However, any other applications filed before the law’s revision could not have been claimed as a product. These pre-revision applications are thus either directed solely to hardware (thus manufacturing of the hardware would be required to qualify for the direct patent infringement) or to a process. See *Justsystem Corp. v. Matsushita Elec. Indus. Co.*, 2005 (Ne) 10040 (IP High Court, Sept. 30, 2005), translated at http://www.ip.courts.go.jp/eng/documents/pdf/g_panel/decision_summary2005ne10040.pdf.

³⁴ 35 U.S.C. § 271(a) (2006).

provides, in Article 2.3(i), a definition of “working” the invention that forms a basis for direct infringing conduct. It includes, among others, the act of providing computer program “products” through an electronic telecommunication line. Thus, where a patent claim is directed to a product, electronically providing a computer program on the Internet is prohibited as a direct act of “working” that invention.

Patent law’s distinction between making a product and using a process makes sense in some industries because, in principle, one may only “use” a process, and not “make” a process. Thus, it makes sense to prohibit the making of a product and using of a process as distinct instances of direct infringing conduct. However, this is no longer true with computer program “products.” Although a computer program is in essence a process, one may copy the entire computer program codes without ever running the program.³⁵ However, the distinction of product and process may become less significant if the law allows patent claims to be directed to both a product and a process for the same invention.

What amounts to prohibited conduct depends upon the claims of an invention. For a computer program patent, three types of claims are feasible: as a product (apparatus or computer program product claim or article of manufacture), a process (method), or a combination (system claim or apparatus and method claims). Variants and combinations of these elements are all possible under multiple claiming systems adopted by the United States, Japan and under the European Patent Convention. A skilful claim drafter may easily change one type of claim into another, weighing the tradeoffs.³⁶

As patent laws often do not define what constitutes “making” or “using,” it is left to the courts to define these terms. If claims are directed to a computer program product (article of manufacture) as such, conduct such as the installation of the program or copying the program itself, by downloading, uploading, or transferring onto a different medium, be considered the making of the program as these acts invariably reproduce the entire copy of the computer program product.³⁷ On the other hand, when a computer program is claimed as a

³⁵ For example, one may reproduce the computer program by copying the codes into a different storage medium, without running the computer program at all. See Keith E. Witek, *Software Patent Infringement on the Internet and on Modern Computer Systems—Who is Liable for Damages?*, 14 SANTA CLARA COMPUTER & HIGH TECH. L.J. 303, 321 (1998).

³⁶ See John R. Thomas, *Of Text, Technique, And The Tangible: Drafting Patent Claims Around Patent Rules*, 17 J. MARSHALL J. COMPUTER & INFO. L. 219, 225–26 (1998).

³⁷ This magnifies the importance of how claims are worded. In a “Beauregard type claim” the computer program is claimed as an article of manufacture. See *infra* note 47. In Japan,

method or a process, the execution of the computer program to achieve the effect of the computer-implemented method, and thereby producing the intended result, may not amount to the actual “making” of the program, but rather, using or practicing of the process.³⁸ If infringement liabilities for these activities are separately regulated, then the scope of protection offered to product claims or process claims may matter significantly.

Strictly, as an instruction composed of different steps and algorithms, a computer program may be viewed in its essence as an action, and thus a process rather than a product. This understanding of the nature of computer programs would lead to a view that all such patents should be viewed as process patents. Thus, only the use of the patented process, rather than the making of the process, would be prohibited, as making of the process would not be logically possible.

When the claim is directed to a process, any other way of manufacturing a computer program, i.e., copying it onto any hardware medium, may not be part of the directly prohibited acts. These acts may then be considered only as indirect acts of contributing or inducing direct infringement by others who actually use the process by “running” the program.³⁹ Process claims, in this respect, have a relatively narrow scope, and in the absence of other authoritative interpretations, direct use of patented process claims related to the computer program may have to be limited to “use” of the program. This narrow reading may be based on the statute if the law provides that use is the only way of “working” the invention.⁴⁰ At the same time, this may be based on the fact that a process (method) may only be used, or its use may be marketed, but that the process itself cannot be made.

“mono(product)” claims are made. *See* Japanese Patent Law, *supra* note 14, art. 2(3)(i); *see generally* Witek, *supra* note 35, at 321.

³⁸ *See, e.g.*, DONALD S. CHISUM ET. AL, *PRINCIPLES OF PATENT LAW* 93 (3d ed. 2004) (In method or process claims “it is the combination or sequence of acts or steps that are patented . . . not the resulting product.”). Only the execution of the computer program would lead to the combination or sequence of acts or steps.

³⁹ *Roberts Dairy Co. v. United States*, 530 F.2d 1342, 1354 (Ct. Cl. 1976) (“It is well established that a patent for a method or process is not infringed unless all steps or stages of the claimed process are utilized.”); *see also* *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1317–18 (Fed. Cir. 2005); *In re Kollar*, 286 F.3d 1326, 1332 (Fed. Cir. 2002); *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 773 (Fed. Cir. 1993) (“The sale of [an apparatus capable of performing a claimed process is] not a direct infringement because a method or process claim is directly infringed only when the process is performed.”); Witek, *supra* note 35, at 321; Thomas, *supra* note 36, at 227–28.

⁴⁰ TRIPS Agreement, *supra* note 16, art. 28; Japanese Patent Law, *supra* note 14, art. 2(3)(ii).

Selling a product directly obtained by the computerized process would be prohibited if that product is produced using a patented computer program. In this context, a question can be raised: what constitutes such a product? Or if such products are the result of patented computer program processes, need those processes be distinguished from, say, a manufacturing process? One could ask whether, for example, a product obtained by an on-demand publication method on the Internet covers the copy of the book published by the publishing method.⁴¹

On the other hand, computer programs may be claimed in both product and process-type claims. In fact, to overcome the statutory subject matter hurdles in the United States, Japan, and Europe, patent applications often contain claims directed to an apparatus or a machine, or include some hardware limitations to a method claim.⁴² Given the recent stricter trend in patent eligibility standards, this may continue or even become more evident. For example, in Europe, where there is an explicit exclusion, European Patent Office has regulated the patentability of computer programs for decades, with the combination of European Patent Convention Articles 52(2) and 52(3). Since a computer program as such is not patentable, if claims instead recite what are not computer programs as such—a various mix of computer programs and hardware—they have generally been viewed as patentable. Decisions issued prior to two IBM

⁴¹ See *On Demand Machine Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1343 (Fed. Cir. 2006). A correct understanding of the “product” of the process, however, would be the actual graphic display and the web page that are produced by implementing the methods, not the books that are sold using the method, as the method itself does not produce the books.

⁴² A flow of decisions in the United States encouraged inclusion of hardware limitations into computer program inventions. See *Diamond v. Diehr*, 450 U.S. 175, 187 (1981); *Parker v. Flook*, 437 U.S. 584, 594–95 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 71 (1972); *In re Alappat*, 33 F.3d 1526, 1544–45 (Fed. Cir. 1994) (holding a new machine is created with a new program); *In re Abele*, 684 F.2d 902, 908–09 (C.C.P.A. 1982); *In re Walter* 618 F.2d 758, 768 (C.C.P.A. 1980); *In re Freeman*, 573 F.2d 1237, 1246 (C.C.P.A. 1978). That theory is reflected in U.S. PATENT & TRADEMARK OFFICE, EXAMINATION GUIDELINES FOR COMPUTER-RELATED INVENTIONS 9 (1995), available at <http://www.uspto.gov/web/offices/pac/dapp/pdf/ciig.pdf>. In Japan, a similar insistence based on Article 2(1) of the Patent Law requires an invention to use a law of nature. See Japanese Patent Law, *supra* note 14, art. 2(1). This is reflected in the requirement for utilization of hardware resources. See JAPAN PATENT OFFICE, EXAMINATION GUIDELINES FOR PATENT AND UTILITY MODEL IN JAPAN pt. VII at 11 (2005) [hereinafter JPO GUIDELINES], available at http://www.jpo.go.jp/tetuzuki_e/t_tokkyo_e/1312-002_e.htm. In Europe, this is expressed as requirement of technical effect. See EUROPEAN PATENT OFFICE, GUIDELINES FOR EXAMINATION IN THE EUROPEAN PATENT OFFICE pt. C, ch. IV, § 2.3.6 (2007) [hereinafter EPO GUIDELINES], available at <http://www.epo.org/patents/law/legal-texts/guidelines.html>; see also Ari Laakkonen & Robin Whaite, *The EPO Leads the Way, but Where To?*, 23 EIPR 5, 244 (2001).

decisions in the late 1990s⁴³ had variously compared computer programs to methods of performing a mental act, or to mathematical algorithms.⁴⁴ In the two IBM decisions, the European Patent Office allowed claims to computer program products, and in *Hitachi*,⁴⁵ while discussing the patent eligibility of a business method, the European Patent Office's technical board defined the subject matter in a most expansive manner and adopted a technical character test that could be implied by the physical features of an entity or by the nature of activity and that may be conferred to a non-technical activity by employing a technical means.⁴⁶

A product claim again can be divided into variants of the claims of an apparatus (as a programmed computer machine, or a device), a computer program that is recorded on a medium (hardware, as well as carrier signal),⁴⁷ a data structure claim, or a system claim. Alternatively, a computer program product claim may be directed to a program product itself, employing functional language.⁴⁸

When a claim is directed to a product as an apparatus that embodies a system, the prohibited acts would include making, using, selling, offering for

⁴³ IBM (Computer Program Product), T1173/97, [1999] OJ EPO 609 (T.B.A. July 1, 1998); IBM (Computer Program Product), T935/97 (T.B.A. Feb. 4, 1998).

⁴⁴ IBM (Text Processing), T38/86, [1990] OJ EPO 384 (T.B.A. Feb. 14, 1989).

⁴⁵ Hitachi, Ltd. (Auction Method), T258/03, [2004] OJ EPO 575 (T.B.A. Apr. 21, 2004).

⁴⁶ *Id.*; see also *Aerotel Ltd. v. Telco Holdings Ltd.*, [2006] EWCA (Civ) 1371 (Eng.) (calling this “the ‘any hardware’ approach”).

⁴⁷ This is sometimes also called as a “medium claim,” or a Beauregard claim in the United States, and claims the medium as an article of manufacture under 35 U.S.C. § 101. *In re Beauregard*, 53 F.3d 1583, 1584 (Fed. Cir. 1995); see Vincent Chiappetta, *Patentability of Computer Software Instruction as an “Article of Manufacture:” Software as Such as the Right Stuff*, 17 J. MARSHALL J. COMPUTER & INFO. L. 89 (1998). This question recently resurfaced in *In re Nujiten*, 500 F.3d 1346 (Fed. Cir. 2007), where the Federal Circuit held a signal is not a composition of matter and, therefore, not eligible for a patent. In Japan this question is unnecessary because a computer program is patentable according to the Japanese Patent Law. See *supra* note 14, art. 2(3).

⁴⁸ See 35 U.S.C. § 112 (2006) (allowing means-plus-function claims). In this sense, means-plus-function claims are a special type of apparatus claim. In Japan, functional claims are allowed by the JPO as a matter of practice, as long as they are specified and supported by the detailed description of the invention and thus meet the requirement of clarity set in Japanese Patent Law. See *supra* note 14, art. 36.6(ii). The JPO relies on internal guidelines to determine when this is met in practice. See JPO GUIDELINES, *supra* note 42, pt. II. Similarly, the EPO does allow an apparatus or a method to be defined in a functional language, but it needs to meet the clarity requirement of Article 84 of the EPC and the sufficient disclosure requirement of Article 83. See EPO GUIDELINES, *supra* note 42, pt. C, ch. III, §§ 4.10, 4.13.

sale, and importing of such an apparatus.⁴⁹ For most computer programs, such an apparatus would be a programmed specific computer apparatus, or any other hardware device that allows the program to be executed, in order for the method to be implemented. The apparatus aspect in the claim may limit the scope of activities, as it would be limited to the direct act related to the claimed hardware. When the hardware element is present in the claim, replicating the same function of the computer program without duplicating the corresponding hardware may not be viewed as “making” the product.⁵⁰ If only a computer program behavior or function is copied, but the claimed hardware element is not reproduced, not all elements of the claims could be present in the allegedly infringing computer program. For example, if a processor is claimed as a hardware element in the claim, unless the same processor is replicated in the infringing device, it will not constitute direct “making” of the claimed invention. Thus, there may be no direct infringing conduct of “making” of the claimed invention in the act of persons who provide functionally similar computer programs electronically unless one can prove that the processor is substituted by a software element, relying on the doctrine of equivalents.⁵¹ This shows that since software can be replaced with hardware, and vice versa, determining whether the direct act of “making” occurred would involve the complex task of claim construction.

On the other hand, when one considers software and hardware equivalence, it may seem antiquated to interpret claims in such a way that every patent

⁴⁹ See TRIPs Agreement, *supra* note 16, art. 28; 35 U.S.C. § 271(a) (2006); Japanese Patent Law, *supra* note 14, art. 2(3).

⁵⁰ See *Justsystem Corp. v. Matsushita Elec. Indus. Co.*, 2005 (Ne) 10040 (IP High Court, Sept. 30, 2005) (interpretation under Japanese law). In a peculiar decision that ultimately invalidated the patents, the court held that although the computer (machine) would fall within the scope of the patent claims when the computer program is installed, selling and manufacturing of the computer programs themselves indirectly infringes the product (apparatus) claims, but not the method claims. *Id.* In a twisted reasoning, the court ruled that the reason was because the computer programs are manufactured and sold not for a particular machine specifically tailored for the computer program, but for the general purpose computer. *Id.* On the other hand, product claims were infringed because when a computer program was installed it created the specifically tailored computer machine. *Id.* Although the computer program would fall within the scope of a patent, the direct infringement was not considered, since the final step would require the installation of the computer program to manufacture the product. *Id.* Thus it could not have been infringed directly by the software manufacturer, but only by the final user. *Id.*

⁵¹ This is hardware-software equivalence. Any software process can be transformed into an equivalent hardware process and vice versa. *Overhead Door Corp. v. Chamberlain Group, Inc.*, 194 F.3d 1261, 1269 (Fed. Cir. 1999); see also Pamela Samuelson et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2319 (1994) (noting that hardware and software are interchangeable).

directed to an apparatus may only be infringed by building new hardware that embodies the software. In fact, after writing the initial program, every subsequent computer program is made by copying. In this aspect, an act of “making” the patented apparatus may be that of changing the general purpose computer into a specific purpose machine, by installing the computer program. Thus, when a hardware limitation is present in the claim, construction of “making” may not be straightforward. The action of installing, uploading, and downloading, which ultimately copy the computer program onto a different medium, could be seen as different aspects of “making.” This is true even if the actual act of making the medium, such as a CD or a general purpose computer, is not performed by the alleged infringer. Thus, reproducing or copying the program in different types of media may be considered as prohibited activities.

In sum, with computer program patents, even the preliminary step of determining whether a prohibited action has been conducted must be based on the claims of the patent. This emphasizes the significance of claim drafting, as the claims will determine not only the scope of the protection, but also which parties are liable for patent infringement and what conduct is prohibited.

IV. EXTRATERRITORIAL INFRINGEMENT - MULTI-JURISDICTIONS AND MULTI-USERS

In the context of patent infringement, multi-jurisdictions can be implicated in two distinctive paths. The first path concerns parallel infringement, which is more procedural. It questions whether a consolidation of infringement claims and proceedings related to parallel patents should be allowed in order to gain judicial economy. This concerns the possibility of enforcing and adjudicating a foreign patent, thus giving an extra-territorial effect to the judgment. It concerns infringing multiple patents that are parallel to one another, based on international treaties, and as such, based on the same patent application by the same applicant, over substantially the same set of claims.

The second is a more substantive question—should consolidation of partial uses be allowed in finding infringement, including activities abroad that are related to a single patent? Rather than seeking a cross-border judgment, this action seeks to give a patent an extra-territorial effect, with the scope of its claims expanded to cover extra-territorial conduct. Partial use concerns conduct related to one patent, rather than parallel conducts based on parallel patents. As this may include intentionally managed conduct, partial use may introduce elements of subjectivity to patent infringement analysis. In this respect, consolidating partial uses into one infringement action is similar to the legal construction of infringement liability. Both of these paths—consolidation of parallel conduct and consolidation of concerted conduct—challenge the principle of territoriality.

This section considers first the procedural aspect of consolidation of proceedings and then the substantive aspect of consolidation of conduct and claim interpretation.

A. Consolidation of Parallel Infringement

The territoriality principle in patent law has long meant that a right granted by law in one country is valid only within the territory of that country. Exceptions to this principle do exist. In addition, sovereign nations bilaterally or multilaterally recognize and sometimes enforce the corresponding rights of other nations based upon the laws of those countries, through international conventions and treaties. Thus, without international treaties and conventions recognizing foreign intellectual property rights, patents are only protected within the territory where they have been granted. The laws of the granting country define and determine what is prohibited as infringement of this right. Thus, exploitation or infringement cannot extend beyond the territory of that country, and disputes based on cross-border transactions are often governed by conflict of law (private international law) rules.⁵²

This principle has been the foundation for many international conventions and treaties on intellectual property rights (“IPR”).⁵³ Even international conventions that seek global harmonization of IPR laws are based on this territoriality principle. For example, the Paris Convention⁵⁴ and the TRIPs Agreement, currently two of the most overarching international legal instruments on IPR, are still based on the territoriality principle of IPR.⁵⁵ Thus, they call for a “national” treatment of foreign nationals, which represents basic rules based on reciprocity, not a uniform protection of IPR throughout the world.⁵⁶

Consolidation of proceedings is governed by the private international law that regulates the issues of jurisdiction, competence of courts, and applicable law. In comparison to intellectual property law, this may be viewed as a question of the process rather than the substantive aspects of rights. A set of norms that would apply equally to the procedure of enforcement may remove this uncertainty. It has been widely suggested that a multilateral convention that

⁵² See Ullrich, *supra* note 7, at 366–67; see also MARTA PERTEGÁS SENDER, CROSS-BORDER ENFORCEMENT OF PATENT RIGHTS 18–44 (2002).

⁵³ See Ullrich, *supra* note 7, at 366–67.

⁵⁴ Paris Convention for the Protection of Industrial Property, art. 4bis(1), Mar. 20, 1883 [hereinafter Paris Convention].

⁵⁵ *Id.*; TRIPs Agreement, *supra* note 16, art. 3.

⁵⁶ Paris Convention, *supra* note 54; TRIPs Agreement, *supra* note 16, art. 3.

recognizes and enforces foreign IPR-related judgments may do the job—courts not only accepting jurisdiction on matters related to foreign IPR, but also granting and recognizing judgments that have cross-border effects.⁵⁷

In Europe, the possibility of achieving this cross-border protection seemed promising at the time of the Brussels Convention, which has become a Council Regulation.⁵⁸ In fact, in the late 1990s, creative interpretation of the Article 6(1) domicile rule, and the fact that patent infringement is not explicitly subject to the exclusive jurisdiction rule of the Brussels Convention, has spawned various cross-border enforcement measures.⁵⁹ These measures were aimed at consolidating proceedings in order to gain judicial economy and to expedite proceedings.⁶⁰ At the same time, this incited different countermeasures to delay infringement proceedings,⁶¹ making use of the exclusive jurisdictional rule for validity proceedings in the Council regulation. This was because, as nearly always, a finding of infringement requires a validly existing right, and when the validity of the right is challenged, the court that exercised jurisdiction over the infringement of the right may have to stay the proceeding while the invalidation proceeding is pending in the court that has competence over the validity matters.⁶²

As with any claim against the infringement of a right, patent infringement requires the valid existence of such a right. However, in contrast to the private nature of infringement, the grant of a patent right involves a public act in the sense that it requires a formal examination, grant, and registration. As a publicly granted right, it involves an act of a national entity via an administrative office, which determines the validity of a patent application. Validity, which is crucial in finding of infringement, is tied to the act of a state and therefore deserves due consideration in the discussion of transnational or cross-border patent infringement litigation. The presumption of validity in the case of patent disputes becomes even more significant if the act of using the invention is extra-territorial. This raises the question of whether validity can or should be

⁵⁷ See, e.g., Rochelle Dreyfuss, *The ALI Project on Transnational Intellectual Property Disputes: Why Invite Conflicts?*, 30 BROOK. J. INT'L L. 819, 825–26 (2005).

⁵⁸ Council Regulation 44/2001, 2001 O.J. (L 12) 1; see Stuart Dutson, *The Infringement of Foreign Intellectual Property Rights—A Restatement of the Terms of Engagement*, 47 INT'L & COMP. L.Q. 659, 660 (1998).

⁵⁹ Council Regulation 44/2001, ch. II § 22(4).

⁶⁰ For a summary of cross-border judgments strategies, see Mario Franzosi, *Cross Border Patent Decisions* 2, 2–4 (2003) available at <http://ssrn.com/abstract=419420>. See generally SENDER, *supra* note 52, at 161–74.

⁶¹ Franzosi, *supra* note 60.

⁶² Council Regulation 44/2001, ch. II, § 25.

challenged at an infringement proceeding if there are specialized administrative offices that specifically examine the quality of patent applications.

This question of validity and infringement lead to a series of recent decisions that signal that jurisdiction may be decided based on the registration (i.e., country of grant) in Europe and the United States. In other words, consolidation of suits involving parallel patents may not be possible if the validity of the patents can be challenged in any of the granting countries. Even in Europe, where the regulation has been referred to the European Court of Justice, in *Roche Nederland BV v. Frederick Primus*,⁶³ the court ruled that consolidation may not be allowed under the defendant domicile rule found in Article 6(1) of the Convention.⁶⁴ Following this decision, in *GAT vs. LuK*,⁶⁵ the advocate general chose a broad interpretation of Article 16(4) of the Convention (Article 22 of the Regulation).⁶⁶ Adopting this interpretation, the European Court of Justice found that “the rule of exclusive jurisdiction laid down therein concerns all proceedings relating to the registration or validity of a patent, irrespective of whether the issue is raised by way of an action or a plea in objection,” thus making any case where the validity is an issue subject to the exclusive jurisdiction rule.⁶⁷

Similarly, in the United States, the Federal Circuit rejected a supplemental jurisdiction claim to hear a foreign patent infringement case, based upon considerations of comity, and ruled that the lower court abused its discretion.⁶⁸ Although the court noted that the consolidation of enforcement proceedings would be more efficient, it was more concerned with the confusion that this consolidation would unleash.⁶⁹ The court noted in particular that like the “Paris

⁶³ Case C-539/03, 2006 E.C.R. I-0000. The conclusion of the case states that the article:

does not apply in European patent infringement proceedings involving a number of companies established in various Contracting States in respect of acts committed in one or more of those States even where those companies, which belong to the same group, may have acted in an identical or similar manner in accordance with a common policy elaborated by one of them.

Id.

⁶⁴ *Id.*

⁶⁵ Case C-4/03, *Gesellschaft für Antriebstechnik mbH & Co. KG v Lamellen und Kupplungsbau Beteiligungs KG*, 2006 E.C.R. I-06509.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Voda v. Cordis Corp.*, 476 F.3d 887, 897 (Fed. Cir. 2007).

⁶⁹ *Id.* at 903.

Convention, nothing in the Patent Cooperation Treaty or the TRIPS agreement contemplates or allows one jurisdiction to adjudicate patents of another.”⁷⁰

In contrast, Japanese courts seem more willing to accept claims for assertion of foreign patent rights. Although consolidation of litigation has not been addressed, a few cases considering foreign patent rights have been heard in Japan. Notably, in 2002, the Japanese Supreme Court dismissed a claim for injunctive relief and compensatory damages based on a United States patent in *Fujimoto v. Neuron Corp.*⁷¹ However, the court did not base the dismissal on its lack of jurisdiction (i.e., the territoriality principle that would give exclusive jurisdiction to United States courts).⁷² Although the court highlighted the territoriality principle of the patent right, it went on to dismiss the claims on the merits.⁷³ Furthermore, in *Coral Corp. v. Marin Bio Corp.*,⁷⁴ the Japanese district court exercised jurisdiction on the negative declaratory judgment of infringement of a United States patent.⁷⁵ The court rejected the defendant’s argument that Japanese courts should not exercise jurisdiction over United States patents, and posited that the territoriality principle may be used to assist in determining the applicable law, but not to deny jurisdiction.⁷⁶ This decision was based on the fact that both parties in the case were Japanese, and that the impact of infringement was primarily in Japan.⁷⁷

B. Extraterritorial Infringement – Cross-Border Consolidation of Partial Use

Partial use deals with the *use of a single patent by multiple actors, in multiple jurisdictions*. In this regard, it is unlike parallel patents. As seen above, when consolidation of infringed parallel patents in different jurisdictions is sought, the initial questions are those of private international law. Multiple parallel patents are fragments in the sense that they all are based on the same

⁷⁰ *Id.* at 899.

⁷¹ *Fujimoto v. Neuron Corp.* (FM Signal Device/Card Reader Case), 802 HANREI JIHŌ 19 (Sup. Ct., Sept. 26, 2002).

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Coral Corp. v. Marin Bio Corp.* (Coral Powder Case), 1151 HANREI TAIMUZU 109 (Tokyo D. Ct., Oct. 26, 2003).

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Id.* For a commentary in English, see Toshiyuki Kono, *Intellectual Property Rights, Conflict of Laws And International Jurisdiction: Applicability of ALI Principles in Japan?*, 30 BROOK. J. INT’L L. 865, 870–71 (2005).

patent application, but they are likely to concern the question of complete use of a parallel patent done outside one jurisdiction in question. Partial use is not a matter of consolidating multiple complete uses of patents, but rather deals with extraterritorial infringement.

If each use is not complete, consolidation requires a substantive analysis of the patent. Finding applicable laws becomes crucial, as infringement liability has very largely been left outside the scope of international harmonization. Consequently, liability concerning partial use is diversely regulated in different countries. Thus, cross-border consolidation of partial use relates to the interpretation of national patent laws that regulate conduct or elements that are not within the territory of the country. This section compares some of the national practices in this regard, in the patent laws of Japan, the United States, and to some extent Europe.

1. Consolidation of Partial Uses and Claims

The problem of partial use of a patent is highlighted in Internet computer program patents, where most patents are sold in diverse territories and jurisdictions. At the same time, even if software patents do not involve the Internet, modular productions across several jurisdictions implicate the territoriality principle. In today's global economy, products are often manufactured by subcontractors in several different countries. For cost efficiency and other reasons, companies may send components of a product to be assembled abroad. These companies then distribute the product using local networks, or re-import it to be sold in the domestic market. Computer program products may also be produced and manufactured in this manner. For example, companies may ship out the product-component modules to be assembled into final products that are either distributed to the local markets or re-imported to the country of origin. In this context, the infringing conduct (*i.e.*, making or using the claimed invention) occurs across borders, and cross-border partial use may occur frequently in the computer program industry.

When analysis of an infringement claim in one country requires an aggregation of fragmented infringing conduct in multiple countries, questions of the patent right's territoriality are inevitable. This is because most patent laws provide that the basis of patent infringement needs to be the entire claim of a patent, and not only a part of it. When partial uses are viewed as infringement, patent laws often require additional subjective requirements to hold indirect or secondary users liable. In a similar manner, when the substantive scope of the claims is expanded, the range of equivalents requires further objective tests. These tests ensure that the claim-based system of granting exclusive rights stays based on the claims. Generally, fragments of infringing conduct spread over

multiple jurisdictions may not form the basis of direct patent infringement in one particular jurisdiction.

As discussed above, TRIPs harmonizes some aspects of conduct in WTO member states by defining importation of infringing materials, *i.e.*, patented products or those obtained from a patented process as infringement.⁷⁸ Exportation of the materials, however, is not explicitly mentioned in Article 28.1.⁷⁹ This may be because, under the territoriality principle, infringing materials within the country of export may not necessarily infringe in the country of import, if no parallel protection exists there. Claims of infringement based on the exportation of parts of a patented invention must be based on domestic law. Such claims are often treated as indirect infringement.

In Japan, the patent law revision of 2006 inserted “exporting” as an act of working the invention as Article 101.3.⁸⁰ The new Article 101.3 prohibits the possession of patented products for the purpose of commercial export.⁸¹ This applies to software claims as well. Article 101.6 similarly prohibits the possession of products that are manufactured by a patent-protected process for commercial export.⁸² Thus, exporting a patented invention is an act of working the invention, and the exporting of products that implement the invention is prohibited as an indirect act of infringement. Conversely, in the United States, exportation is not a direct act of infringement, but falls squarely under the secondary infringement liability of 35 U.S.C. § 271(f): “Whoever without authority supplies or causes to be supplied in or from the United States [some or all components of a patented article], . . . shall be liable as an infringer.”⁸³

In most countries, direct patent infringement calls for a complete use of all patented claims. This policy is due to the claim-based system that patent law uses to define the metes and bounds of the invention. Society grants patent ex-

⁷⁸ TRIPs Agreement, *supra* note 16, art. 28.

⁷⁹ This does not mean that members are obliged to include “export” as part of the prohibited acts, as TRIPs works only as a minimum standard. *See also id.* art. 51 (authorizing customs authorities to suspend importation and exportation of infringing materials upon the right holder’s written request).

⁸⁰ *See JP Law Revision 2006*, *supra* note 14, art. 2.

⁸¹ *Id.*

⁸² *Id.* Japanese Patent Law distinguishes a process from the manufacturing process of Article 2.3(iii). Process patents do not always necessarily result in a tangible product. A manufacturing process produces a tangible thing.

⁸³ 35 U.S.C. § 271(f)(1)–(2) (2006).

clusivity for inventions, not for their component parts, which may well have been present in the prior art and public domain.⁸⁴

The doctrines of indirect and non-literal infringement, on the other hand, can provide some degree of protection. Indirect infringement⁸⁵ claims allow patentees to recover infringement costs from those who are not liable under direct infringement. If parts of a patented invention are exported without the patentee’s authorization, direct use of the entire invention may occur exclusively in the country of import, outside the reach of the patentee’s right. In this case, indirect infringement liability allows the right holder to recover damages from the exporter. As such, unlike direct infringement, the exporter’s use does not have to be complete, so long as the subjective requirements are satisfied. Indirect infringers, in this sense, are those whose use of the claimed invention is partial, and whose actions may lead to direct infringement.

Non-literal infringement doctrines based on patent claim interpretation,⁸⁶ often combined with indirect infringement liability, substantively allow the scope of patent claims to include elements that are not literally present in the text, and thus may be used to protect against partial use. Non-literal infringement doctrines, such as the doctrine of equivalents, often require the substitution of elements, which superficially may not appear as a form of element protection based on a “partial infringement”. However, in the sense that even where only parts are used, non-literal infringement doctrinally constructs a complete use by taking into account non-essential substitutions and omissions. This may protect an invention’s most essential aspects against duplication by including infringers that substitute or omit only non-essential elements of invention. In this sense, non-literal infringement doctrines provide a degree of partial protection.⁸⁷

⁸⁴ This is why the French partial infringement theory (*contrefaçon partielle*) and Germany’s element protection theory may need to be viewed with skepticism. See JOCHEN PAGENBERG, Alexander Harguth & Julien Fréneaux, *The French Practice*, in INTERPRETATION OF PATENTS IN EUROPE 132–38 (2006); Jochen Pagenberg, *Conclusion and Proposals for Greater Harmonization*, in INTERPRETATION OF PATENTS IN EUROPE 278–80 (2006).

⁸⁵ Indirect infringement is called secondary infringement in the U.K., contributory or induced infringement in the United States under 35 U.S.C. § 271(b)–(c), and indirect infringement in Japan under article 101 of the Patent Act.

⁸⁶ The doctrine of equivalents, found in the patent laws of the United States, Japan, and some European countries, is the most significant doctrine in this aspect. However, any doctrines that expand the scope of a patent—such as doctrine of partial infringement—may be included.

⁸⁷ However, even when patent scope is expanded beyond the literal text of the claims, courts often require an infringing device to cover the entire invention, not just some of its elements. In the United States, the all-element rule of the doctrine of equivalents calls for all of the claim elements to have equivalents in the infringing devices. Even when the court makes a

Partial use challenges the principle of territoriality when the acts of substitution, omission, and/or complete use occur in different territories. The fundamental problem with extra-territorial partial use is that equal protection against infringement may not exist among the various nations involved. Doctrinally, it mainly concerns the effect of national doctrines of infringement dealing with partial use. In this aspect, the question becomes whether to give national patents an extra-territorial effect, such that activities outside the territory may be consolidated together with local activities. One particular activity—exportation of parts and elements of invention—is important in this context.

Consolidation of fragmented partial use calls for a broader interpretation of national patent laws to expand patent claims beyond their territorial scope. The result essentially gives nationally-granted patents an extra-territorial effect. This would significantly undermine the territoriality principle, as the effect of a domestically-granted right would reach beyond the territory of its grant.

2. Patent Claims and Extraterritorial Infringement

Extraterritorial infringement, as seen above, may expand a patent's scope, as it complements the partial domestic use with an action abroad. In this sense, it consolidates incomplete actions by multiple parties into one complete infringement. In either case, claim drafting plays a key role.

As argued above, in computer program patents, the claims form the basis for determination of infringing conduct. This is because what would constitute making or using the invention depends on how the claims are formulated. In this respect, two aspects need exploration. The first is a question of patent claims, requiring a review of how to interpret patent law and patent claims, taking multiple points of reference into account during claim interpretation. The second aspect is more normative—how to treat partial use and how to construct a “partial” liability in patent law. As this issue unavoidably deals with policy questions surrounding secondary or indirect liability, it is discussed in Section V below.

A computer program could consist of any of the following: program code, program components (modules), sub-components, algorithms, and program features. A claim for a computer program product may be directed to any

centralist interpretation of the claims, the entire invention must be duplicated, not just some of its combinations. In countries that are notoriously using sign-post-like claiming systems, such as Germany, the U.K. and Japan, the courts often strive to find the entire invention (“essence”) in the infringing devices, and not just some of its elements.

or all of these elements. Potentially infringing similarity to a patented computer program may be found among any of these elements.

Replication of a computer program is complex. Patent claims do not contain code language, but rather a textual description of the software's function. When compared, similarity between potentially infringing programs and the claims of the software patent are more likely to be found in functional aspects of the program embodied in the claim language, rather than in actual duplication of the code.⁸⁸

Global communication means that invention, claim drafting, end use, and infringement can now occur internationally.⁸⁹ The extraterritorial reach of patent claims begins with the claim drafter. As software patents have gained recognition as patentable subject matter, patentees have become keenly aware of the potential pitfalls of drafting territorial-specific claims. To overcome uncertainty, patentees may draft claims so that the scope of the patent includes activities that may otherwise fall outside of the territory of the grant.

As a result, patents increasingly include several "perspective claims" that allow claim interpretation from multiple vantage points defined by the invention's components.⁹⁰ Such reference points may include the location of the server, client, system, and communication medium so that infringement of these claims could be framed from diverse reference points. Problems arise when these diverse reference points result in there being no single party in one location to carry out all the elements of the claim. This would mean that there will be no direct infringement of the complete invention by any one party. As detailed in section V below, in most countries, indirect infringement liability is constructed in a substantively different manner than direct infringement liability. Thus, framing patent claims so that a single action by a competitor could be read directly from the text of claims would help the patentee to bring a claim of direct infringement. This may particularly be the case for Internet patents, where the end users are not the competitors. The technique of claiming multiple perspectives allows competitors to be included as the direct infringers.

When patents are claimed to include multiple territorial reference points that may be subject to different patent laws, the partial use problems discussed in section IV.B.1 above may arise. Consolidation in this context refers to the

⁸⁸ This does not mean that code duplication will not occur.

⁸⁹ See Lemley et al., *supra* note 10, at 256; see also Timothy S. Teter, *Multiple Perspective Patent Claim Drafting, Research in Motion, and EOLAS: Why Legislative Reform Efforts Will Likely Fail to Prevent U.S. Internet Patents From Having Extraterritorial Effects*, 7 ABA COMPUTER & INTERNET LITIG. J. 11, 11 (2005).

⁹⁰ Teter, *supra* note 89, at 11–12.

importance of each reference point, and how combination of elements, including sub-components, needs to be considered in the interpretation of prohibited conduct.

In patent law, a distinction exists between method (process claims) and apparatus claims (system or computer product claims). In this sense, the location of the physical invention and the location of its use are distinguishable.⁹¹ In a more tangible invention, the product implementing the invention is present where it is used, but in the case of software, the use (action) may not be in the same location with the physical invention, i.e., hardware devices that implement the invention. This may be one consequence of extending patent protection to less physically tangible subject matter.

Case law in different countries seems to reflect treatment of method claims differently from apparatus claims. Commonly, case law seems to indicate that the actual location of some of the elements may not prevent the assertion of rights spelled out by the system claims. On the other hand, the infringement of the method claims by acts conducted abroad seems to be viewed negatively.

In the United States, in a patent infringement case concerning wireless BlackBerry e-mail systems, the Federal Circuit held that claim elements located abroad may be covered by a United States patent.⁹² Three components were essential to the asserted patents: an “originating processor,” an “interface switch,” and a “destination processor.”⁹³ In the e-mail system, the originating processor was the processor sending the email, and the destination processor was the processor receiving the email.⁹⁴ The interface switch was called the relay, and it was located in Canada.⁹⁵ Each of the three components was essential to the process, and as the relay was located in Canada, it may seem that there could be no direct infringer, since the use could not be complete within the United States. However, the court held the use to be within the United States so long as the control and beneficial use of the infringing system is within United States territory, and the location of a component “in Canada did not, as a matter

⁹¹ See Jennifer Lane, *NTP, Inc. v. Research in Motion, Ltd.: Inventions Are Global, But Politics Are Still Local—An Examination of the BlackBerry Case*, 21 BERKELEY TECH. L.J. 59, 67 (2006).

⁹² *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1317 (Fed. Cir. 2005), *cert. denied*, 126 S. Ct. 1174 (2006). After certiorari for this case was not granted, doubts were raised on the validity of the NTP’s patents and the parties settled.

⁹³ See *id.* at 1294–311 (explaining components of the e-mail system).

⁹⁴ *Id.* at 1299.

⁹⁵ *Id.* at 1317.

of law, preclude infringement of the asserted system claims in this case.”⁹⁶ The court distinguished method claims from system claims based on its interpretation of section 271(a) of the United States Patent Act.⁹⁷ The system claims were held to be infringed despite the location of at least one component abroad, but the method claims were not directly infringed.⁹⁸

An earlier, similar patent infringement case in the U.K. considered an Internet-based gambling system operated from a host computer in Antigua.⁹⁹ The court of appeals held that the physical location of the host computer did not detract from the “use” of the claimed gaming system in the U.K., and that the supply of a CD in the U.K. “will be intended to put the invention into effect in the United Kingdom.”¹⁰⁰

In Japan, the Tokyo district court denied injunctive relief based upon a method patent when the entire method was not performed within Japan.¹⁰¹ This case concerned a method for formulating electrodeposited images, where the final step of the method was conducted abroad by exporting the affixing dial plate.¹⁰² However, the decision adopted an instrumentalist theory of patent infringement, ruling that the accumulation of multiple actors’ conduct may lead to a finding of infringement if such conduct is used as an instrument by another actor.¹⁰³ In other words, the court implied that it is possible to construct a complete use from concerted partial uses, even with respect to method claims.

In contrast, in a copyright infringement case involving peer-to-peer file sharing, where the use did not rely on the claims, the Tokyo district court found infringement of the author’s right of public communication despite the server’s Canadian location.¹⁰⁴

⁹⁶ *Id.* at 1317 (citing *Decca, Ltd. v. United States*, 544 F.2d 1070, 1083 (Ct. Cl. 1976)).

⁹⁷ *Id.* at 1317–18.

⁹⁸ *Id.* For criticism that this ruling ignores the fact that essential elements of the invention were located abroad, see Daniel P. Homiller, *From Deepsouth to the Great White North: The Extraterritorial Reach of United States Patent Law After Research In Motion*, 2005 DUKE L. & TECH. REV. 0017, ¶ 14 (2005), available at <http://www.law.duke.edu/journals/dltr/articles/pdf/2005dltr0017.pdf>.

⁹⁹ *Menashe Bus. Mercantile Ltd. v. William Hill Org. Ltd.*, [2002] EWCA (Civ) 1702, [33] (Eng.).

¹⁰⁰ *Id.*

¹⁰¹ *Electrodeposited Image Case*, 1764 HANREI JIHŌ 112 (Tokyo D. Ct., Sept. 20, 2001).

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *File Rogue Copyright Case*, 1810 HANREI JIHŌ 29 (Tokyo D. Ct., Jan. 29, 2003).

V. DIRECT OR INDIRECT LIABILITY OF MULTIPLE USERS

The finding of direct infringement in partial use cases requires a legal construction of a complete use. A complete use may be constructed by claim interpretation—by employing the doctrine of equivalents. However, the doctrine of equivalents requires substitution. In this aspect, when there is no substitution by equivalents, infringement liability by other legal construction that completes the use has to be considered. This is often done by indirect infringement liability.

Patent infringement liability involving several parties may be framed in at least four different ways: *direct*, *indirect*, *vicarious*, and *joint* liability, depending upon how subjective and objective elements are required and regulated. Ultimately, each form of liability allows a patentee to sue different defendants, and defines how far the scope of patent rights may extend.

Direct infringement, whether literal or by equivalents, looks only at the objective elements of patent infringement. In contrast, indirect infringement and joint direct infringement (both literal and non-literal) introduce subjective elements such as intent to the inquiry. Vicarious liability and joint liability require an element of control in both direct and indirect infringement actions. In addition to these four types of liability related to the multiple parties, a possibility of element protection may exist in countries where there is a strong tradition of construing claims in terms of the “essence of invention.” A partial infringement doctrine that exists in some European countries is an aspect of direct infringement that turns to the production of the essential part of the invention even when there is no evidence of substitution.¹⁰⁵

Direct and indirect infringement liability is based in statutory patent law. Conversely, vicarious and joint liability are often constructed from relevant civil and tort laws. Joint or vicarious liability is often extended to conduct that is not explicitly regulated by statutory patent laws.¹⁰⁶ This is necessary be-

¹⁰⁵ See Mario Franzoni, *The Italian Practice*, in INTERPRETATION OF PATENTS IN EUROPE 164 (2006). Franzoni cites a decision of the Court of Appeal of Venice, which stated that a single element or sub-combinations of elements may fall within the scope of the patent covering additional elements, provided that the single element or the sub-combination is so important that it characterizes the patented invention. See also Pagenberg, *supra* note 84, at 278–280.

¹⁰⁶ See, e.g., *On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1334–45 (Fed. Cir. 2006). The Federal Circuit reversed the district court’s finding of joint infringement without challenging the theory of joint patent infringement liability. *Id.* More recently, in *BMC Resources, Inc. v. Paymentech, L.P.*, 498 F.3d 1373 (Fed. Cir. 2007), the court refused to expand the direct liability to joint infringement based on the vicarious liability of “direction and control.” *Id.* at 1381–82.

cause patent infringement liability only stems from acts of direct or indirect infringement prohibited by patent statutes. Conduct allowed under the patent law may still be illegitimate under other laws.¹⁰⁷ Application of direct liability via vicarious liability or joint liability is differently constructed and should be approached cautiously, as injection of tort liability could undermine the original policy goals of having legally defined patent infringement liability.

Most countries regulate direct patent infringement liability slightly differently from other types of wrongdoings.¹⁰⁸ Often, direct infringement does not require the infringer's intent, knowledge, or negligence. Since independent invention is not a defense to infringement, direct patent infringement liability is often regarded as akin to strict liability, in that does not require proof of fault.¹⁰⁹ Different requirements may exist depending on the available remedies, but the general focus is a comparison of the patented invention and the allegedly infringing device. It is generally understood that liability for direct infringement is constructed in an objective manner, and does not require a subjective inquiry into the intent and knowledge of the infringer.

Japanese patent law, for example, provides for injunctive relief under patent law Article 100(1) and does not require intent or negligence to show direct infringement. As for compensatory damages, Article 103 of the statute presumes negligence based on the public notice given by publication of patents under Articles 64.2 and 66.3 of the Japanese patent law.¹¹⁰ Similarly, in the United States, the infringer's knowledge or negligence is not relevant to a determination of direct infringement.¹¹¹ Equitable considerations are necessary for a permanent injunction.¹¹² Though the patent laws of Europe are not completely harmonized, they seem to follow along the lines of United States and Japanese

¹⁰⁷ For example, Japanese tort liability is based on MINPŌ [Civil Code], art. 709. See TAMURA YOSHIYUKI, CHITEKIZIASANHŌ [Intellectual Property Law] 284–86 (4th ed. 2006). In the U.K., this liability would be based on concepts of joint tort-feasance and unjust enrichment. See LIONEL BENTLEY & BRAD SHERMAN, INTELLECTUAL PROPERTY LAW 533 (2d ed. 2004).

¹⁰⁸ See, e.g., Roger D. Blair & Thomas F. Cotter, *Strict Liability and its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799, 807–08 (2002) (examining possible alternatives to the United States patent system including an intent-based system, a negligence system, and a pure strict liability system); see also TAMURA, *supra* note 107, at 284–88 (discussing Japanese patent infringement construction); Peter Mes, *Indirect Patent Infringement*, 30 IIC 531, 531 (1999).

¹⁰⁹ See Blair & Cotter, *supra* note 108, at 807. Blair & Cotter argue that given the rule of patent marking in 35 U.S.C. § 287, strict liability could be misleading because patent infringement liability “simply is what it is and does not need a label.” *Id.*

¹¹⁰ See TAMURA, *supra* note 107, at 284.

¹¹¹ 35 U.S.C. § 271(a) (2006).

¹¹² See *eBay, Inc. v. MercExchange*, 547 U.S. 388, 390 (2006).

law, under which negligence and intent are either presumed or not required to find direct infringement.¹¹³

In contrast, indirect liability extends infringement liability to indirect acts. In the United States, this includes active inducement under 35 U.S.C. § 271(b). Active inducement often is understood as overt acts of inducement, with specific intent to bring about direct infringement. At the same time, 35 U.S.C. § 271(c) holds contributorily liable those who sell a “component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, *knowing* the same to be especially made or especially adapted for use in an infringement of such patent” (emphasis added). Furthermore, § 271(f) provides that both of these liabilities extend to an infringer who “supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention.”

Japanese law similarly extends indirect infringement liability to contributory infringement and inducement under section 101. Before the 2002 revision, only those who commercially supplied components of products¹¹⁴ to be used exclusively for patented products or processes were indirectly liable.¹¹⁵ With the introduction of software claims, the 2002 patent law revision relaxed this condition of “exclusive articles” to include so-called dual-use articles.¹¹⁶ Under the current law, Articles 101.2 and 101.5(1) extend liability to those who commercially provide components that are indispensable for the invention (both process and product) with the knowledge that such components will be used for manufacturing a patented product or for performing a patented process. The same Article extends this liability to those who possess patented products or products made from patented processes for the purpose of commercial export.¹¹⁷

In Europe, no harmonization exists between the member states’ laws on patent infringement liability. However, some aspects of the Community Patent Convention were introduced into the national laws of some European countries,

¹¹³ For a discussion of German law, under which indirect infringement liability is a “single-stage strict-liability tort” which does not require independent direct infringement, *see* Mes, *supra* note 108, at 532; *see also* IPC REPORT, *supra* note 33, at 22 (comparing indirect infringement provisions in the United States, Japan and European countries).

¹¹⁴ The original language in the law is *mono*, meaning “thing.” The Cabinet Secretariat’s translation is “product.” *See* Japanese Patent Law, *supra* note 14, art. 101. In the context of indirect infringement, this is close to “components” in 35 U.S.C. § 271(f).

¹¹⁵ After 2006 *JP Law Revision*, *supra* note 14, this is under article 101.1. and 101.4.

¹¹⁶ Japanese Patent Law, *supra* note 14, art. 101.

¹¹⁷ *See* arts. 101.3 & 101.6 after the *JP Law Revision 2006*, *supra* note 14.

most notably the U.K.¹¹⁸ Article 26 of the Convention provides that indirect infringement liability extends to those who supply “means, relating to an essential element of the invention, for putting [the invention] into effect” with knowledge of infringement and within the territory. This liability excludes staple commercial products, “except when the third party induces the person supplied to commit acts prohibited.”¹¹⁹

At a glance, indirect infringement liability may be more important when claims are directed to a product, rather than a method. Consolidation of partial uses with respect to products raises a question concerning the supply of components or parts. The act of supply involves not only domestic supply but also exportation. As seen above, exporting is not explicitly part of the prohibited act, under Article 28 of the TRIPs agreement. Unless national patent law provides regulation on exportation, interpretation on pre-export acts such as offering or marketing, and indirect acts of use must be considered.

For software patents, module use or sub-combination is likely to fall under indirect partial use. In this context, interpretation of whether the modules are parts, (“all or substantial portion of components”¹²⁰) or the indispensable “articles,”¹²¹ or “means, relating to an essential element of [an] invention”¹²², are significant points of debate and leave room for interpretation.

Partial use becomes even more significant in the context of standards and interoperability. The patent laws and patent office practices in Japan, the United States, and the European Patent Office do not require computer program patent applications to disclose complete program codes, and sometimes even discourage program code listings as a sole source of disclosure.¹²³ If patent

¹¹⁸ Compare U.K. Patent Act, *supra* note 20, § 60, with Community Patent Convention, *supra* note 10, arts. 25–28. U.K. Patent Act § 130(7) provides that this section is “so framed as to have, as nearly as practicable, the same effects in the United Kingdom as the corresponding provisions of the European Patent Convention, the Community Patent Convention and the Patent Co-operation Treaty have in the territories to which those Conventions apply.”

¹¹⁹ Community Patent Convention, *supra* note 14, art. 26.

¹²⁰ 35 U.S.C. § 271(f) (2006).

¹²¹ Japanese Patent Law, *supra* note 14, arts. 101.2, 101.5(1).

¹²² Community Patent Convention, *supra* note 14, art. 26(1); U.K. Patent Act, *supra* note 20, § 60(2).

¹²³ In the United States, “flow charts or source code listings are not a requirement for adequately disclosing the functions of software.” *Fonar Corp. v. Gen. Elec. Co.*, 107 F.3d 1543, 1549 (Fed. Cir. 1997). In Europe, “program listings in programming languages cannot be relied on as the sole disclosure of the invention.” EPO GUIDELINES, *supra* note 42, pt. C, ch. II, § 4.15. In Japan, “[i]n principle, program listings should not be included in the specification or drawings. However, if they are short excerpts written in a computer language generally known to

rights exists on standards, a code duplication to achieve “interoperability” of computer programs often results in a partial use of the invention, as it would necessarily duplicate part of the codes or program functions that cover the interface.¹²⁴ In this sense, nearly all computer program products adopting an interface standard need to duplicate the standardized codes or functions to achieve interoperability, and this would likely be a cause of action for indirect infringement liability, if the right holders were to assert their rights.

Further, other complications may arise. Even if claim language is directed to an apparatus, computer programs are still processes. They combine a concrete apparatus and media with abstract methods and instructions. This begs questions as to what constitutes components or essential elements of an invention, and which extraterritorial activities involving such articles, components or means constitute infringement.

Disputes over what defines “components” recently reached the United States Supreme Court. The Court was asked to rule on whether computer programs may be viewed as the components that fall within the reach of § 271(f) liability in *AT&T Corp. v. Microsoft*.¹²⁵ The case concerned AT&T’s patent on a technology to digitally encode and compress speech.¹²⁶ Microsoft’s Windows operating system (“OS”) includes codes that process speech in the manner claimed by the AT&T’s patent when installed.¹²⁷ Microsoft produced the copies of Windows OS by first shipping a golden master disk or electronic transmission to a foreign recipient.¹²⁸ The foreign recipient would produce copies for installation on computers made and sold abroad.¹²⁹ The information contained in the master disk was not present in the final version.¹³⁰

Both the district court and the Federal Circuit held that intangible information or data can be a component within the meaning of the § 271(f),¹³¹

a person skilled in the art and helpful for understanding the invention, such listings are allowed to be included.” JPO GUIDELINES, *supra* note 42, pt. VII-1 at 10.

¹²⁴ See Nari Lee, *Standardization and Patent Law - Is Standardization a Concern for Patent Law?*, 29–35 (2004), available at <http://ssrn.com/abstract=610901>.

¹²⁵ 127 S. Ct. 1746 (2007).

¹²⁶ U.S. Patent No. Re. 32,580 (filed Sept. 18, 1986).

¹²⁷ *AT&T*, 127 S. Ct. at 1750–52.

¹²⁸ *Id.*

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *AT&T Corp. v. Microsoft Corp.*, 414 F.3d 1366, 1372 (Fed. Cir. 2005); *AT&T Corp. v. Microsoft Corp.*, 71 U.S.P.Q.2d (BNA) 1118, 1121 (S.D.N.Y. 2004).

based on the authority of *Eolas Technologies Inc. v. Microsoft Corp.*¹³² In this context, two questions were presented: whether software code (an intangible sequence of “1”s and “0”s) may be a “component” and whether software replicated abroad from a master version intended to be replicated and exported from the United States may be deemed to be “supplied” from the United States.¹³³

On appeal from the Federal Circuit, the Supreme Court held that Microsoft was not liable for infringement under § 271(f). The Court held that abstract software code does not qualify as a component¹³⁴ because it is an idea lacking physical embodiment and cannot be a “usable, combinable part of a computer” analogous to a detailed set of instructions, or a blueprint.¹³⁵ The Court distinguished “a copy of Windows” stored on a medium, which is a component under § 271(f), from Windows in the abstract.¹³⁶ Thus, the copies of Windows used for installation on computers abroad had been made but not “supplied” from the United States, as the physical copies of Windows were supplied from abroad.¹³⁷ In the Court’s opinion, this interpretation supports a presumption against the extraterritorial application of U.S. patent laws, and that “[i]f AT&T desires to prevent copying in foreign countries, its remedy today lies in obtaining and enforcing foreign patents.”¹³⁸

This interpretation excludes intangible software code and copies of software, and creates a loophole for the software manufacturers to avoid indirect infringement liability under § 271(f). In fact, the Court acknowledged this loophole, and the majority opinion expressly invited legislative consideration of such a loophole.¹³⁹ This consideration was reflected to a degree in Japanese patent law.¹⁴⁰

The 2002 revision of Japanese patent law was actually motivated by module protection. The explanatory report that accompanied the patent law revision gives a module as an example of “parts” within the scope of indirect infringement liability.¹⁴¹ Considering this, the disputes would not be focused on

¹³² *AT&T*, 414 F.3d at 1372; *Eolas Techs. Inc. v. Microsoft Corp.*, 399 F.3d 1325, 1339 (Fed. Cir. 2005).

¹³³ *Eolas*, 399 F.3d at 1339.

¹³⁴ *AT&T*, 127 S. Ct. at 1754–56.

¹³⁵ *Id.*

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.* at 1759.

¹³⁹ *Id.*

¹⁴⁰ IPC REPORT, *supra* note 33, at 23.

¹⁴¹ *Id.*

whether an abstract computer program without the tangible medium would be considered a component of an invention or not, but rather, the disputes would likely focus on whether a specific module or component is “indispensable” to the invention or not. This turns on Justice Stevens’s dissenting opinion in *AT&T*,¹⁴² where he found it “difficult to understand why the most important ingredient of that component is not also a component.”¹⁴³ In other words, software that instructs the user to engage in the infringing conduct is seen as indispensable to any patented computer program. On the other hand, this interpretation is not infallible, as it may be tantamount to element protection.

A benefit of taking a narrow approach to the application of indirect infringement liability for partial use is that some pro-competitive uses may be encouraged. For example, it would allow software re-use, a practice that save times and effort.¹⁴⁴ This re-use would be particularly helpful if codes are recycled to achieve interoperability. Without explicit exemption or licenses, reuse of a computer program component may well be infringement. A narrow application of indirect infringement liability would allow some re-uses to occur, even while viewed as “indispensable” elements of the patented invention.

Patent eligibility of intangible information or instructions—computer programs—is becoming mainstream in major patenting nations. In response, there seems to be a move or a demand to consider an expansion of the indirect infringement liability to these intangible products that are exported globally. This seems to call for an expansion of not only the scope of activities covered by the infringing conduct, but also the geographic reach of the protection that covers the products, process and their components (dual use or multiple use products with subjective evidence of knowledge and intent). However, courts in the United States and Japan seem to be taking a cautious approach in allowing extraterritorial reach of their domestic patent rights.

VI. CONCLUDING REMARKS

Constructing a coherent understanding of infringement liability for these fragmented users and fragmented uses may require a rather creative interpretation of law that takes into consideration the pragmatic needs of prohibiting certain acts while promoting others. This is especially important in the context of the Internet. As seen above, while partial uses are regulated under some pat-

¹⁴² *AT&T*, 127 S. Ct. at 1762 (Stevens, J., dissenting).

¹⁴³ *Id.*

¹⁴⁴ See generally Mark A. Lemley & David W. O’Brien, *Encouraging Software Reuse*, 49 STAN. L. REV. 255 (1997).

ent laws, the liability of multiple users in multiple territories brings about complex questions about whether their conduct or actions may be combined or consolidated.

In the global economy, consolidation of partial uses, including those conducted abroad, needs to be viewed from this perspective. The consolidation of either proceedings or substantive scopes requires reconsideration of infringement laws based on the territoriality principle. A broad finding of liability in the use of components of inventions beyond the granting territory may be an over-protection that discourages participation in e-commerce.

At the same time, finding no liability may promote modular production and may create markets in products and services, in essence encouraging a form of free-riding. Ultimately, regulating one act as direct or indirect infringement requires a normative policy choice that balances the exclusive rights of the patentee and the rights of the users of the patented innovation.